REMARKS

Reconsideration of this application is respectfully requested.

Applicants thank Examiners Crouch and Reynolds for the courtesy of the Interview conducted on July 24, 2003.

Applicants have amended claims 92, 101, 108, 116, 121, and 126-129. Claims 131-145, which are derived from claims 128 and 129, are new and are presented to emphasize that the claimed combinations are patentable irrespective of the process by which they are made. No new matter is introduced through this amendment.

Claims 92-127 and 130

Rejections under 35 U.S.C. § 101

Claims 92-127 and 130 were provisionally rejected under 35 U.S.C. § 101 as allegedly claiming the same invention as that of claims 57-68 and 71 of copending Application No. 09/658,862.

Applicants have amended claims 92-127 to recite that the pre-existing mammal is an "adult" mammal. Claim 130 recites that the nucleus is of a "quiescent" cell. Claims 57-68 and 71 of copending Application No. 09/658,862 do not contain these limitations. Accordingly, applicants are not claiming the same invention as that of claims 57-68 and 71 of copending Application No. 09/658,862, and respectfully request withdrawal of the rejection.

Double Patenting Rejection

Claims 92-127 and 130 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,252,133. Solely to expedite allowance of the pending claims, and not in acquiescence to this rejection, applicants will submit a Terminal Disclaimer in

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compliance with 37 C.F.R. § 1.321(b) when the claims are otherwise indicated to be allowable.

Claims 92-127 and 130 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 13-21 of U.S. Patent No. 6,147,276. Solely to expedite allowance of the pending claims, and not in acquiescence to this rejection, applicants will submit a Terminal Disclaimer in compliance with 37 C.F.R. § 1.321(b) when the claims are otherwise indicated to be allowable.

Rejections under 35 U.S.C. § 112, first paragraph

Claims 92-125 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to the skilled artisan that the inventors had possession of the claimed invention at the time that the application was filed. The Office Action alleges that the specification does not provide support for the phrase "same set of chromosomes."

Applicants have removed the recitation of "same set of chromosomes" from claims 92-125. Accordingly, this rejection is moot.

Claims 116 and 121 were rejected under 35 U.S.C. § 112, first paragraph, because the specification allegedly does not provide enablement for insertion into non-enucleated cells. Solely to expedite prosecution, applicants have amended claims 116 and 121 to recite "enucleated" oocytes. Accordingly, the rejection is moot.

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Rejections under 35 U.S.C. § 112, second paragraph

Claims 92, 95, 101, 108, 109, 116, 119, 121, 123, 126, 127, and 130 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for a number of reasons, which will be discussed separately below.

The Office Action alleges that claims 92, 101, 108, 116, 121, 126, 127, and 130 contain the phrase "has the same set of chromosomes as the pre-existing mammal," but that there is no definition of this phrase in the specification. Applicants have removed the recitation of "has the same set of chromosomes as the pre-existing mammal" from the pending claims. Accordingly, this aspect of the rejection is moot.

The Office Action alleges that claims 92 and 126 contain the phrase "embryo clone develops," which is confusing as to what the clone becomes by virtue of developing. Applicants traverse the rejection.

The skilled artisan would understand that claims 92 and 126 refer to embryonic development generally, and that the embryo clone may be at any stage of development. As stated in the specification: "In direct development, the reconstituted embryo from step (a) is simply allowed to develop without further intervention beyond any that may be necessary to allow the development to take place. In indirect development, however, the embryo may be further manipulated before full development takes place." (Specification at 15, lines 26-31.) Accordingly, applicants submit that claims 92 and 126 are not indefinite and respectfully request withdrawal of the rejection.

The Office Action alleges that claims 92, 116, 121, 126, and 130, which contain the phrase "is capable of developing to term," is confusing as to the metes and bounds of the claim. Applicants traverse the rejection.

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Applicants' claims 92, 116, 121, 126, and 130 are not confusing as to the metes and bounds of the claim. The recitation "is capable of developing to term" is a functional limitation that requires that an embryo have the capacity of full-term development to a mammal when implanted into a host mammal. For example, the recitation of "capable of developing to term" in claim 92 means that the claim covers only those embryo clones that, when implanted into a host, would develop to term.

Functional language, by itself, does not make a claim indefinite. *See In re Swinehart*, 169 U.S.P.Q. 226, 229 (C.C.P.A. 1971)("there is no support, either in the actual holdings of prior cases or in the statute, for the proposition, put forward here, that 'functional' language, in and of itself, renders a claim improper.") Since the metes and bounds of applicants' claims are readily determined, applicants' claims are not indefinite and applicants respectfully request withdrawal of the rejection.

The Office Action alleges that claims 95, 109, 119, and 123 are confusing as to further limiting claim 92. Independent claims 92, 108, 116, and 121 recite "the nucleus of the differentiated cell or a cell obtained by culture thereof." Dependent claims 94, 109, 118, 123 recite "wherein the differentiated cell or cell obtained by culture thereof is a cultured cell." Thus, in independent claims 92, 108, 116, and 121 the nucleus may, alternatively, be of "the differentiated cell" or "a cell obtained by culture thereof." In dependent claims 94, 109, 118, and 123, the nucleus must be of "a cell obtained by culture thereof." Thus, claims 94, 109, 118, and 123 are limited in this manner. Accordingly, applicants respectfully request withdrawal of the rejection.

The Office Action alleges that claims 126 and 127 are unclear because, if the donor cell is genetically modified, then the resulting mammalian embryo or mammal

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cannot be a clone. Applicants have amended claims 126 and 127 to clarify that the animals are transgenic animals, and have removed the recitation "clone." Accordingly, applicants respectfully request withdrawal of the rejection.

Rejections under 35 U.S.C. § 102(b)

Claims 92-127 and 130 were rejected under 35 U.S.C. § 102(b) over several publications that teach the production of embryos and mammals. (McLaughlin et al., 1990; Prather et al., 1989; Yong et al., 1991; Cheong et al., 1993; Yang et al., 1992; Sims et al., 1991; and Stice et al., 1995). It is the Office's position that the mammals of the prior art cannot not be distinguished from applicants' claimed mammals. The Office concludes that the claimed cloned embryos and mammals are not novel because they are copies of embryos and mammals that existed before. (Paper No. 29 at 14.)

Applicants traverse the rejection. Applicants' claimed mammals and embryos are novel. Applicants' clones cannot be the same as any mammal of the prior art for a simple reason: applicants' claimed mammals are ***clones of pre-existing, adult mammals***. Similarly, applicants' transgenic mammals are cloned offspring of pre-existing, adult mammals that additionally contain a genetic modification.

The fact that applicants' mammals are cloned offspring of pre-existing, adult mammals results in distinctions over the mammals of the prior art. First, applicants' mammals are not strictly identical to the mammals of the prior art. As applicants have shown, and unlike inanimate compounds, no two mammals are exactly the same. Among other factors, differences in oocyte contributions and uterine environment will lead to phenotypic differences between any two mammals. Therefore, applicants' mammals cannot be anticipated because they did not previously exist.

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In addition, the mammals of the prior art exist during a specified period of time during which they are alive. Each of the mammals of the prior art was born on a specific day. None of applicants' claimed clones were born on the same day as any of the mammals of the prior art. Rather, applicants' claimed clones must be born well after the "pre-existing, adult mammal" from which they are derived. Therefore, to the extent that applicants' clones are copies of mammals that existed before, applicants' claimed mammals are "time-delayed" copies.

A time-delay relative to the parental mammal is an *inherent phenotypic feature* of applicants' ***clones***. This time-delay is an important aspect of applicants' discovery and provides a phenotypic distinction between applicants' clones and the mammals of the prior art. Applicants' determined how to avoid the time restraints imposed on all living mammals at birth, namely, that their unique genetic constitution would be extinguished at their death. As a result, applicants' claimed clone will always be younger than the pre-existing, adult mammal from which it is generated. The "relative age" of the clone will always be different than the parent. Therefore, applicants' claimed clones exist during a different time period than the time period during which the mammals of the prior art exist. This feature of applicants' claimed clones provides a patentable distinction between applicants' claimed mammals and the mammals of the prior art.

Applicants' process generates features in the resultant mammals that cannot be found in the prior art mammals. These features include phenotypic differences due to environmental factors and a time-delay in the existence of applicants' mammals. The present situation is unlike the situation where an inanimate compound (e.g., sulfur) exists in the prior art and the claims recite the same compound produced by a novel

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method. In the present situation, the genomic DNA of a cloned mammal, the time-delay generated by cloning, and environmental influences, assure that applicants' cloned mammals are distinct from any mammal that previously existed. Consequently, applicants' claimed invention cannot be anticipated by the prior art.

In support of its position, the Office states: "The fact is no difference could be told between a three year old 'nuclear donor' mammal and its clone as an example." (Paper No. 29 at 14.) The Office's conclusion ignores the fact that a three year old nuclear donor would always be three years older than its clone. The reduction in relative age of a clone as compared to its parent is a patentable distinction that cannot be ignored. Withdrawal of the rejection is respectfully requested.

Claims 128 and 129

Previously pending claims 128 and 129 were the subject of a particular discussion in the July 24th interview. These claims were previously indicated to be free of the prior art, and were not rejected on either double patenting basis. In fact, these claims were rejected only under 35 U.S.C. § 112, first and second paragraphs.

Rejections under 35 U.S.C. § 112, first paragraph

The Office provided only two reasons for the rejection of claims 128 and 129 under 35 U.S.C. § 112, first paragraph. The first reason was the "same set of chromosomes" language, which has now been removed from the claims. The second reason was the assertion that the application "does not contemplate" the combination of either a cell and a clone made from the cell (claim 128) or a parent animal and a clone derived from the parent (claim 129). With respect to this second reason, applicants

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believe that a closer reading of the specification reveals that the inventors absolutely contemplated these combinations as features of the invention.

For example, the specification begins by discussing that the invention relates to the generation of animals:

> This invention relates to the generation of animals including but not being limited to genetically selected and/or modified animals.
>
> The reconstruction of mammalian embryos by the transfer of a nucleus from a donor embryo to an enucleated oocyte or one cell zygote allows the production of genetically identical individuals. This has clear advantages for both research (i.e. as biological controls) and also in commercial applications (i.e. multiplication of genetically valuable livestock, uniformity of meat products, animal management). One problem with the use of early embryos as nuclear donors is that the number of offspring which can be produced from a single embryo is limited both by the number of cells (embryos at the 32-64 cell stage are the most widely used in farm animal species) and the efficiency of the nuclear transfer protocol.
>
> In contrast to the use of embryos as nuclear donors, the ability to produce live offspring by nuclear transfer from cells which can be maintained in culture is an objective which have [sic, has] been sought for some time by animal breeders. The ability to produce cloned offspring from a cultured cell line would offer a large number of advantages over the use of early embryos. These include: the production of large numbers of identical offspring over a long time period (cultured cells can be frozen and stored) and the ability genetically to modify and/or select cell populations of the required genotype (e.g. sex) prior to embryo reconstruction.

(Specification at 1, lines 1-33.) Having read these passages in the specification, the skilled artisan would understand that the invention encompassed generating cloned offspring of mammals that were viewed as being genetically valuable and cloned offspring produced from cultured cells. The use of the phrase "cloned offspring" would signal to the skilled artisan that the offspring was a "clone" of a parental mammal. This phrase specifies that the offspring bears a particular, unique relation to that mammal, namely, that it is a clone of that parent. Consequently, the skilled artisan would recognize that this pair of mammals was unlike any other pair of mammals that had

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existed previously. The clone would have the same set of chromosomes as its parent since it was generated by nuclear transfer.

Nevertheless, applicants have removed the recitation of "has the same set of chromosomes" from the pending claims. Accordingly, this basis for the rejection of claims 128, and 129 is moot.

The specification further discusses the properties of cloned animals in relation to the source of the nuclear donor cells:

> Animals produced by transfer of nuclei from a source of genetically identical cells share the same nucleus, but are not strictly identical as they are derived from different oocytes. . . . In the area of cattle breeding the ability to produce large numbers of embryos from donors of high genetic merit may have considerable potential value in disseminating genetic improvement through the national herd.

(Specification at 19, lines 7-25.) Having read this passage from the specification, the skilled artisan would understand that the invention encompassed clones of mammals of high genetic merit. The skilled artisan would also understand the importance of the relationship between the source of the donor nucleus, be it a parental mammal or a cell culture, and the cloned offspring, namely, that they share the same nucleus. The skilled artisan would understand that this relationship was part of applicants' invention.

Furthermore, the specification discusses the relationship between cultured cells, the animals from which they are derived, and the animals produced from them:

> It is also contemplated that a new cell line to act as a source of nuclear donor cells could be produced from embryos formed according to the preceding description or the resulting foetuses or adults.

(Specification at 16, lines 32-35.) Having read this passage of the specification, the skilled artisan would understand that the invention encompassed not simply cell lines,

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but a continuum encompassing adults, from which cells might be derived, and cloned mammals generated by nuclear transfer from these cells.

In Example 5, the specification describes the generation of cloned animals from cultured cells from a variety of sources:

> Nuclear transfer has been conducted using three new cell types, designated OME, BLWF1 and SEC1. OME (ovine mammary epithelial) cells are an epithelial cell line established from a biopsy removed from the mammary gland of an adult 6 year old Fin-Dorset ewe.

(Specification at 32, lines 4-8.) Specifically, Example 5 describes ovine mammary epithelial cells (OME) established from a biopsy removed from the mammary gland of an adult 6 year old Fin-Dorset ewe and a clone (Dolly) produced from these cells. In Table 5, the specification summarizes the generation of live offspring with these cells, indicating that a live lamb (Dolly) was born from nuclear transfer with the ovine mammary epithelial cells. Thus, Example 5 provides an example of a cell culture comprising somatic cells from an adult, non-human mammal (OME) and a clone of an adult, non-human mammal produced from the cells (Dolly), as well as an example of an adult mammal (6 year old Fin-Dorset ewe) from which a differentiated donor cell has been taken and a clone thereof (Dolly).

Thus, it can be seen that the disclosure clearly allows the reader to recognize that applicants invented the claimed invention. Applicants point out that the written description requirement does not require that the originally-filed disclosure contain the exact words of the claims. *Fujikawa v. Wattanasin*, 39 U.S.P.Q.2d 1895, 1904 (Fed. Cir. 1996). Moreover, it does not matter how applicants convey the invention to one skilled in the art. *In re Wright*, 9 U.S.P.Q.2d 1649, 1651 (Fed. Cir. 1989). Therefore,

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applicants' specification can provide an adequate written description without containing the exact words of the claims. *See Fujikawa*, 39 U.S.P.Q.2d at 1904.

In addition, the burden of showing that the claimed invention is not described in the specification rests on the Office in the first instance, and it is up to the Office to give reasons why a description not in the exact words used in the claims is insufficient. *In re Wertheim*, 191 U.S.P.Q. 90, 98 (C.C.P.A. 1976). The Office has not fulfilled this burden since the Office has given no reasons why applicants' description is insufficient. *See id.* The Office has supported its rejection only by stating that "the specification does not contemplate" the claimed invention. This is insufficient to support a rejection under 35 U.S.C. § 112. *See id.* Accordingly, withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 128 and 129 were also rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for the "same set of chromosomes" language, which has now been removed from the claims. Accordingly, applicants respectfully request withdrawal of the rejection.

Claims 131-145

New claims 131-145 reflect the combination of the donor cell and the cloned animal or the donor animal and the parent animal. These claims lack the process steps of claims 128 and 129, but are believed to be free of the prior art in the same manner as claims 128 and 129. If claims 128 and 129 and 131-145 are found to be allowable, applicants would be pleased to consider canceling the other pending claims without prejudice and pursuing them in a continuation application.

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Conclusion

Applicants respectfully submit that this application is now in condition for allowance. If the Examiner believes that issues remain to be addressed before a Notice of Allowance, applicants respectfully request that the Examiner contact the undersigned to discuss any outstanding issues.

If there is any fee due in connection with the filing of this Amendment, please charge the fee to Deposit Account No. 06-0916.

Respectfully submitted,

Dated: August 22, 2003

By: _____

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